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RESPONSES TO U.S. EPA AND OEPA COMMENTS ON THE REMEDIAL DESIGN PRELIMINARY DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION - FEBRUARY 1997

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RESPONSES TO U.S. EPA AND OEPA COMMENTS ON THE REMEDIAL DESIGN, PRELIMINARY DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

FEBRUARY 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

RESPONSES TO U.S. EPA COMMENTS ON THE REMEDIAL DESIGN, PRELIMINARY DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION

GENERAL COMMENTS

Commenting Organization: U.S. EPA — Commentor: Saric
Section : NA — Page : NA — Line : NA
General Comment : 1.

Comment: The document text is not consistent with the drawings included. The text describes systems operations that are contrary to the control scheme shown on the drawings. The document should be revised, and the drawings should be corrected and coordinated with the intended design.

Response: The document and drawings are consistent. The drawings indicate operation by shared display computer control and operator interface which will be via the Distributed Control Systems (DCS) located at the AWWT Control Room. This is evidenced by the instrument designator shown on the sketch; however, due to the size of the drawings this was not completely legible.

Action: The pre-final design will be transmitted on larger size drawings and the instrument designators will be more legible depicting the remote operation.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : NA — Page : NA — Line : NA
General Comment : 2.

Comment: The overall design should be coordinated for internal consistency and compatibility of systems described in the text. The entire project should be reviewed for continuity, and if possible, the construction contracts should be modified so that one contractor is responsible for the entire system construction; for example pipe lines should be installed by one contractor, rather than having one pipe line installed in three separate construction contracts, possibly by as many contractors.

Response: The construction strategy was produced to provide for the efficient use of resources. The construction efforts involved in this project must be coordinated to ensure an overall workable system. The Injection Demonstration Project will install piping also associated with the South Field Extraction System because the work is to be completed in the same trenching. Constructing the pipelines in a common trench provides maximum benefit for the construction dollar. The prime driver for completing this work with multiple contracts is funding availability.

Action: No revision to the design is required.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 2.2 — Page : 2-4 — Line : NA
Original Specific Comment : 1.

Comment: The text provides an explanation of the South Plume removal action pipeline system, including the 20-inch force main and a 12-inch discharge line. It is not clear why the force main is larger than the discharge line. If both pipelines are to carry the same flow, there should not be such a difference in pipe size. Typically, the force main is smaller than the gravity line. This discrepancy should be clarified.

Response: The force main is an existing pipeline which was sized to be 20 inch based upon the design criteria at the time of the design of the South Plume Recovery System. The 12 inch line was sized to provide for the flow requirements as currently conceived. The South Plume Optimization design has evolved since the issuance of the preliminary design package and now does not have separate discharge headers to accommodate the affected landowner desire to tie in the discharge from the two new off-property extraction wells (Wells 1 and 3N) into the South Plume Removal Action pipeline along an existing right-of-way. Concurrence regarding the landowner's request for this tie in was received from EPA and OEPA at a meeting with the landowner on August 28, 1996. This concurrence was also recently revisited at the aquifer restoration status meeting held with EPA and OEPA on January 13, 1997. The combined flow will now be routed via the existing 20 inch force main and can be diverted to either treatment or discharge in the SFES Valve House.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 2.3 — Page : 2-4 — Line : NA
Original Specific Comment : 2.
Comment: See original specific comment 1.
Response: See original specific comment 1 response.
Action: See original specific comment 1 action.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 3.4.1 — Page : 3-15 — Line : NA
Original Specific Comment : 3.
Comment: The text states that the flow control valves will be remotely operated from the advanced wastewater treatment facility control room. It is not clear how the flow control valves will be operated, because drawing No. SK-N-04364 indicates a local operation, not a remote operation. This discrepancy should be clarified.
Response: Drawing No. SK-N-04364 indicates operation by shared display computer control and operator interface which will be via the DCS located at the AWWT Control Room. This is evidenced by the instrument designator shown on the sketch.
Action: The pre-final design will be transmitted on larger size drawings and the instrument designators will be more legible depicting the remote operation.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 3.4.1 — Page : 3-16 — Line :NA
Original Specific Comment : 4.
Comment: See original specific comment 3 above.
Response: See original specific comment 3 response.
Action: See original specific comment 3 action.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 3.4.2 — Page : 3-16 — Line : NA
Original Specific Comment : 5.
Comment: The text states that the injection demonstration will have a 50,000-gallon injection water supply tank. However, the text does not explain why a 50,000-gallon tank is needed. It appears that adequate water will be available as long as the extraction system is working, because the water treatment system is treating water continuously and at a much higher flow rate than needed for injection. The need for a 50,000-gallon tank should be included in the pre-final design criteria document.
Response: The injection water supply tank was designed to hydraulically isolate the Injection Demonstration (ID) system from the remainder of the groundwater extraction and

treatment network therefore simplifying the control of the ID system. Also, the tank was designed to allow some reserve pumping time in case of a loss in upstream injection water supply. An engineering decision was made between the amount of reserve time to allow and tank economies, and a 50,000-gallon tank size was selected.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 3.4.2 Page : 3-16 Line : NA
Original Specific Comment : 6.

Comment: The text states that each injection well will be capable of influent sampling at the well head. However, the source of injection water is the same for all injection wells. Because the water quality will not change at each injection well, one sampling point near the injection demonstration system supply pump should be adequate. The need for sampling at each of the injection wells should be explained in the response to comments document.

Response: An influent sampling point at the well head of each injection well is a very inexpensive feature and a cost effective way to sample the injection water. It is true that all of the injected water is coming from the same source, but having a sampling point at each well head will facilitate documenting if any chemical changes are occurring in the piping system that is delivering injection water to the well. A goal of the injection demonstration will be to determine the degree of biofouling that takes place in the injection system and to develop a preventive maintenance program that will match the severity of the biofouling problem.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 3.4.2 Page : 3-17 Line : NA
Original Specific Comment : 7.

Comment: The text states that injection wells will have a polyvinyl chloride (PVC) casing to minimize cost and a wire-wrapped stainless-steel screen to provide better resistance. The use of PVC appears to be acceptable; however, it is not clear why this approach is not being used to design extraction wells. If the entire system is designed for the same 15-year life, the use of PVC should be considered for well casings other than injection wells.

Response: PVC was considered for use in extraction wells at the FEMP as a way to reduce well installation costs. When costs were closely analyzed though it was revealed that at the FEMP well casing material costs represent a very small fraction of the total cost of installing a well. The decision was made to use stainless steel in extraction wells in an effort to maximize the longevity of the wells. Stainless steel should also provide better strength for installing pumps into the wells and pulling pumps from the wells.

DOE was informed by the screen manufacturer that they may have trouble meeting manufacturing tolerances on the larger diameter PVC screens. Therefore, the decision was made to use stainless steel screens on both injection and extraction wells.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 3.4.2 Page : 3-17 Line : NA
Original Specific Comment : 8.

Comment: The text states that each injection well will have two injection tubes, with one tube assembly sized for 100 to 150 gallons per minute (gpm) and the other for 150 to 200 gpm. Because each injection well will be operated at the injection rate of 200 gpm, the response to comments document should explain why two injection tubes are needed.

Response: Each well is being designed with a contingency injection tube that will accommodate continued operation of the well if injection flows should temporarily decrease below 150 gpm. Under normal operating conditions, each injection well will inject 200 gpm. During injection a positive pressure needs to be maintained on the injection flow so that the injection water is not allowed to cascade down the injection tubing. When cascading occurs, the injection water picks up air bubbles. Over time, air bubbles in the injection water are carried out into the aquifer formation where they limit porosity by displacing the groundwater. Cascading water would also allow the injection water to pick up more dissolved oxygen. Injection water with a higher dissolved oxygen content will have a greater potential for oxidizing iron. Without the contingency injection tube, injection would have to be stopped when the injection rate drops because the injection water would cascade down the injection tubing designed for 200 gpm. To continue operating temporarily under lower injection flow conditions without cascading, a second injection tube will be installed for an injection rate between 100 to 150 gpm.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 5.1 — Page : 5-2 — Line : Figure 5-1
Original Specific Comment : 9.

Comment: The following issues were identified in the diagram of the injection well: (1) the flow control valve should always be located downstream from the flow meter to avoid creating turbulence in the meter section, (2) the air release valve should always be installed at the highest point, (3) a vacuum breaker and air release valve at the injection tubes should be included at the well head to allow water columns to drain when the well is not in use or when power fails, and (4) a sampling port is not required at the injection wells. These issues should be addressed in the response to comment document, and the figure should be revised for the pre-final design package.

Response: 1) With the state of technology in mag flow meters and articulated control valves the relative positioning of the two does not considerably affect the responsiveness of the system. However, the relative positioning of the two will be reversed in the final design. 2) This sketch is not a scale drawing and merely shows the components in a graphic nature. In the physical layout as will be seen in the final design package, the Air Release Valve (ARV) is the high point of the layout. 3) The cascading of water and subsequent introduction of air into the system on shutdown is not desired. The chemical injection port could be used to break vacuum should the draining of the downcomers be desired for a lengthy shutdown. 4) A sample port was provided at each of the injection wells to allow maximum flexibility in the sampling strategy. This port can also serve to drain the above ground portion of the pipeline for maintenance purposes.

Action: Relative positioning of the control valves and flowmeters will be reversed. The ARV will be the local high point at the injection pad. See drawings 95X-5900-P-00419 and 95X-5900-P-00428.

Commenting Organization: U.S. EPA — Commentor: Saric
Section : 5.2 — Page : 5-4 — Line :NA
Original Specific Comment : 10.

Comment: The text states that a pressure-indicating transmitter will monitor the discharge pressure at each new injection water supply pump. The transmitter will be used solely for indication and will not influence any automatic functions. A simple pressure gauge would be adequate. The purpose of and need for this pressure transmitter is not clear. The need for a pressure-indicating transmitter should be explained in the response to comments document.

Response: The text is in error. This pressure indicating transmitter will provide automatic shutdown of the injection water supply pumps on high or low pressure.

Action: The pre-final design will show the automatic shutdown features of the pressure transmitters. See drawing 95X-5900-N-00449.

Commenting Organization: U.S. EPA   Commentor: Saric
Section : 5.2   Page : 5-4   Line : NA
Original Specific Comment : 11.

Comment: The text states that each injection well will be controlled by a flow control valve (FCV). It is assumed that the FCV will be used to maintain a preset rate of flow because there is no outside signal coming into it (See Drawing SK-N-04365). In addition, the text states that the valve will also receive a signal from pressure transducer located inside the well casing. This transducer closes the FCV on high or low water levels. This water level pressure transducer is also interlocked with another pressure transducer that closes FCV on negative pressure. However, the following items need to be clarified:

1) Figure N.5-1 and Drawing No. SK-N-04365 do not agree with the text.

2) The FCV should be located downstream from the flow meter.

3) Operating injection wells with only 1 pound per square inch (psi) back pressure may cause the FCV to close prematurely because of flow and pressure fluctuations in the system.

4) It is not clear how the pressure of the injection well will be reduced to 1 psi. Elsewhere the text states that injection water supply pumps will operate at 150 pounds per square inch gauge (psig), and no pressure reducing valves are shown.

5) It is not clear how the system will react if one of the FCV valves closes in an injection well. The supply pumps have a constant speed of 1,000 gpm, and the maximum injection rate is 200 gpm per well. The text should discuss how this system will react to the pressure increase.

The above issues need to be addressed in the response to comments document and in the pre-final design submittal.

Response: 1) The text should have stated that the operator input for flow will be a preset value which is set locally. The ability to control this system using the DCS from the AWWT Control Room will be added to this system at a later date.

Action: No revision to design is required.

Response: 2) With the state of technology in mag flow meters and articulated control valves the relative positioning of the two does not considerably affect the responsiveness of the system. However, the relative positioning of the two will be reversed in the final design.

Action: The relative position of the control valve and the flow meter will be reversed in the pre-final design. See drawings 95X-5900-P-00419 and 95X-5900-P-00428.

Response: 3) The restriction orifice is installed at the downcomer effluent to ensure a minimum 1 psi back pressure to prevent cascading and air entrainment. The normal operation of the system will maintain a pressure > 1 psi at this point due to the design of the orifice. Flow and pressure fluctuations of the magnitude to cause closing the FCV due to injection tube pressure are not anticipated.

Action: No revision to design is required.

Response: 4) The pressure will not be reduced to 1 psi. The FCV will modulate the flow to allow injection of water at the preset rate (nominally 200 gpm) and the pressure seen at the injection tube entrance will be a function of the pressure necessary to over come friction loss in the pipe from the FCV to the aquifer and the pressure dropped across the restriction orifice. The reference to the 150 psi is from the pipeline design rating which is not the anticipated operating pressure of the system.

Action: No revision to design is required.

Response: 5) When an FCV closes then the system pressure will increase. This increase in system pressure will cause the other 4 injection well FCVs to throttle down to maintain their set flow rates. The injection water supply pumps will continue to operate at their constant speed and the system curve will shift to a new operating point and the new flow rate (nominally 800 gpm) at a new discharge pressure. Overall affect is no change in injection rate on any of the other 4 wells but pump discharge pressure increases.

Action: No revision to design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 5.2 Page : 5-4 Line : NA
Original Specific Comment : 12.

Comment: The text states that a "low level alarm on the injection water supply tank will secure the injection water supply pumps." The text should clarify how a low level alarm will secure the injection water supply pumps, because such an alarm should shut down these pumps. This issue should be clarified in the response to comment document.

Response: The text reference to securing the supply pumps is synonymous with shut down of these pumps. Final condition is that the pump motors will stop therefore pumping is secured.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.3.1 Page : 6-2 Line : NA
Original Specific Comment : 13.

Comment: The text in this section refers to a 50,000-gallon water supply tank for the injection system demonstration. A 50,000-gallon tank appears to be excessively large for this application. The text should be revised to explain why such a large tank is required. Also see Specific Comment 5.

Response: The 50,000-gallon tank was designed to hydraulically isolate the Injection Demonstration System from surges in the upstream groundwater extraction and treatment network. Also, it was designed to allow some reserve pumping time in case of a loss in upstream injection water supply. An engineering decision was made between the amount of reserve time to allow and tank economies, and a 50,000-gallon tank size was selected.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.4.1 Page : 6-3 Line : NA
Original Specific Comment : 14.

Comment: The text states that the maximum working pressure outside the well head will be kept below 150 psig. This seems to be a very high pressure for the system when the required back pressure at the injection well is only 1 psig. An explanation for operating at such a high pressure should be included in the response to comments document.

Response: The line referenced in this section is for the extraction system and is independent from the injection system. The referenced 150 psig rating is the design rating on the system and is not intended to be the operating pressure of the system.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.4.2 Page : 6-3 Line : NA
Original Specific Comment : 15.

Comment: The text states that the maximum pressure will not exceed 150 psig in the injection demonstration supply lines. The back pressure at the injection well is only 1 psi, and there are no pressure reducing valves in the system. The response to comments document should explain why it is necessary to operate this system at such a high pressure (maximum 150 psig). See also Specific Comment #14.

Response: The referenced 150 psig rating is the design rating on the system and is not intended to be the operating pressure of the system. The supply pump discharge is estimated to be between 80-100 psi, with pressure at the wells lower due to friction loss.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.6 Page : 6-4 Line : NA
Original Specific Comment : 16.

Comment: The text describes the cleanouts and refers to valves that will have a steel cast iron body with flanged ends attached to ductile iron pipes. If high density polyethylene (HDPE) pipe is used for the force main, the cleanouts can be made from HDPE pipe and fused to the force main (eliminating a mechanical joint required to connect ductile iron to HDPE). The response to comments document should explain why it is necessary to use ductile iron pipe for cleanouts. The response to comments document should also explain how a gate valve on a cleanout can create a sudden surge in the flow in the pipe line.

Response: Ductile iron wyes and iron body valves are more durable than HDPE for this application. Clean out tools initially inserted into this pipe could cause damage to the HDPE at these tight bends. Iron body valves have post indicator assemblies as standard stock which eliminates the need for a manhole. The gate valves were chosen to ensure that the operation of the valve would not create sudden surges in the flow. A gate valve is not a quick open or close valve and as such its' operation can be controlled to prevent surges in flow.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.3 Page : 6-5 Line : NA
Original Specific Comment : 17.

Comment: The text refers to electrically actuated ball valves with fully closed limit switches used for flow control. Ball valves are typically used for shut off (that is, on-off) service, and butterfly valves are used for flow control. The response to comments document should explain how a ball valve will be used in flow control based on a 4 to 20 milliamp (mA) direct current (dc) signal, and it should identify the function of the fully closed limit switch.

Response: The ball valve referenced is a segmented ball valve which has acceptable flow controlling characteristics. The use of the segmented ball valve requires a smaller actuator to control the valve. The fully closed limit switch gives indication to the operator of the status of the control valve when it is closed therefore indicating that the well is shut down.

Action: The pre-final design will clarify that these ball valves are segmented ball valves which are capable of adequately controlling the system. The pre-final design will allow butterfly valves as an alternate selection. See Section 13400 - Attachment A, Sheets 15, 16, 17, and 18 of Specifications.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.4 Page : 6-5 Line : NA
Original Specific Comment : 18.

Comment: The text describes the injection well flow meter with a flow range of 0 to 500 gpm. This flow range appears to be excessively large. The maximum flow rate to each injection well is 200 gpm. The response to comments document should explain why a flow meter with a 0 to 500 gpm range is used.

Response: Text was in error. The flow meters are 0-200 gpm in the final design package.

Action: The pre-final design will reflect the correct flow range of 0-200 gpm. See Section 13400 - Attachment A, Sheet 6 and 7 of Specifications.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.5 Page : 6-5 Line : NA
Original Specific Comment : 19.

Comment: The text states that injection demonstration well pressure transmitters can indicate the discharge pressure for each injection demonstration well. It is not clear why pressure monitoring is needed at the injection well. The text in Section 6.1.3 states that this pressure will be about 1 psi. If a low pressure interlock is required to close a valve, a pressure switch would operate more efficiently. The response to comments should provide justification for use of transmitters. See also the other comments pertaining to injection well flow control.

Response: A pressure indicating transmitter was chosen to allow the controller to monitor/record line pressure as well as flow and well water level. In the future the injection wells will be upgraded to be controlled by the DCS from the AWWT Control Room and the operators will be able to monitor well performance remotely using this signal. The communication system required for the remote functions will not be available until the South Field Extraction Project is constructed. The design for this remote operation will be included in a revision to the SFES design package.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.6 Page : 6-6 Line : NA
Original Specific Comment : 20.

Comment: The text refers to an electrically activated ball valve as a injection demonstration well flow control valve. The use of ball valves is not advised for flow control. A butterfly-type valve is normally used for flow control. The response to comments should explain why ball valves are used for flow control.

Response: The ball valve referenced is a segmented ball valve which has acceptable flow controlling characteristics. The use of the segmented ball valve requires a smaller actuator to control the valve.

Action: The pre-final design will clarify that these ball valves are segmented ball valves which are capable of adequately controlling the system. The pre-final design will allow butterfly valves as an alternate selection. See Section 13400 - Attachment A, Sheets 15, 16, 17, and 18 of Specifications.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.7 Page : 6-6 Line : NA
Original Specific Comment : 21.

Comment: The text refers to a pressure indicating transmitter on each discharge from the injection demonstration pumps with local and remote indication. Drawing No. SK-N-04365 does not indicate remote indication. In addition, the need for a remote pressure indication at each injection supply pump is not clear. The text also states that high and low pressure interlocks will be provided to shut off the pumps. High pressure shutdown can occur quite often (see Comment 11), and a pressure switch with low and high pressure presets can be used to shut down the pumps. The anticipated pressure range should be provided in the response to comments document and in the pre-final design package.

Response: Drawing No. SK-N-04365 should have indicated remote indication of pressure. This remote pressure indication will give the operators important data on the performance of the system. This system is hydraulically isolated from the remainder of the groundwater extraction/treatment network and will be operated in relatively static manner and it is not anticipated that pressure fluctuations of the magnitude to cause the pump shutdown will occur. The anticipated pump discharge pressure range is 80-100 psi with the initial setting for high pressure shutdown at 115 psi and low pressure shutdown at 50 psi.

Action: The pre-final design will reflect the remote indication of the pressure indication. See drawing 95X-5900-N-00449.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.8 Page : 6-6 Line : NA
Original Specific Comment : 22.

Comment: The text states that a low- and high-level interlock will be provided to close the flow control valve. Seasonal groundwater level fluctuation will also have an effect on the system, and it may cause low- or high-level shutdowns. The need for the high-low interlock from the injection well level transmitter is not understood. The need for the high-low interlock should be justified in the response to comments document and in the pre-final design package.

Response: The high and low level interlocks will be set above and below the max high and max low seasonal water level. The high level interlock will prevent an artesian affect should the well screen become clogged and the low level interlock is an abnormal unexpected situation (e.g. a prolonged drought condition in the aquifer or lack of supply water) and will secure the system until the situation can be evaluated and corrected.

Action: The pre-final design will contain the high and low level setpoints. See Section 13400 - Attachment A, Sheets 12 and 13 of Specifications.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.9 Page : 6-6 Line : NA
Original Specific Comment : 23.

Comment: The text in this section provides information on the injection demonstration water supply tank level control valve; however, the text does not explain what will happen to the treated water flow when the injection demonstration water supply tank is full and the level control system closes the level control valve. It is not clear whether this valve can shut down the entire extraction and treatment system, and no bypass is shown to allow the treatment system to operate. This issue should be addressed in the response to comments document.

Response: The treatment effluent can be directed to 3 different effluent paths. One path is to the Injection Water Supply Tank for the ID system. Another path is to the Treated Water Storage Tank at Building 51 to provide water for backwash purposes. The third path is directly into the AWWT main effluent line which discharges to the Great Miami River via the site outfall line. Should the LCV supplying the Injection Water Supply Tank close then the flow will be diverted directly to the main effluent discharge through LCV 1150 shown on Drawing No. SK-N-04365.

Action: The pre-final design will label the destination of the main effluent discharge line. See drawing 95X-5900-N-00449.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.10 Page : 6-6 and 6-7 Line : NA
Original Specific Comment : 24.

Comment: See original specific comment : 23.

Response: See original specific comment response 23.

Action: See original specific comment action 23.

Commenting Organization: U.S. EPA Commentor: Saric
Section : 6.7.11 Page : 6-7 Line : NA
Original Specific Comment : 25.

Comment: The text describes the advanced wastewater treatment facility expansion and the aeration tank level control valve as a pneumatically actuated ball valve. All other valves are electric. If possible, the system should use electric valves for compatibility. In addition, ball valves are not normally used for flow control. The response to comments document should explain the reason for using a pneumatically activated ball valve.

Response: The valves at the AWWT have a readily available supply of instrument air and were chosen to match existing control valves at Building 51. The remainder of the Injection Demonstration valves were specified as electric due to no instrument air being available. The ball valve referenced is a segmented ball valve which has acceptable flow controlling characteristics. The use of the segmented ball valve requires a smaller actuator to control the valve.

Action: The pre-final design will clarify that these ball valves are segmented ball valves which are capable of adequately controlling the system. The pre-final design will allow butterfly valves as an alternate selection by the contractor, subject to approval of the designer. See Section 13400 - Attachment A, Sheets 15, 16, 17, and 18 of Specifications.

Commenting Organization: U.S. EPA Commentor: Saric
Section : Appendix B.9 Page : B-7 Line : NA
Original Specific Comment : 26.

Comment: The text refers to the isolating valves as manually operated butterfly valves. However, ball valves provide better shut off, and butterfly valves are better for flow control. The use of butterfly valves for shut off service should be explained in the response to comments document.

Response: Butterfly valves offer adequate shutoff capabilities and are cheaper (when actuators are not needed) than the ball valves.

Action: No revision to the design is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section : Appendix D Page : Drawing SK-N-04363 Line : NA
Original Specific Comment : 27.

Comment: Drawing No. SK-N-04364 shows local indication and operation in the SPO valve house, which contradicts information provided in Section 3.4.1, page 3-15, and in Section 6.7.2, page 6-14. DOE should clarify this discrepancy in the response to comments document and the pre-final design package.

Response: Drawing No. SK-N-04364 indicates operation by shared display computer control and operator interface which will be via the DCS located at the AWWT Control Room. This is evidenced by the instrument designator shown on the sketch.

Action: The pre-final design will be transmitted on larger size drawings and the instrument designators will be more legible depicting the remote operation.

Commenting Organization: U.S. EPA Commentor: Saric
Section : Appendix D Page : Drawing No. SK-N-04365 Line : NA
Original Specific Comment : 28.

Comment: Flow control valves are normally installed downstream from the flow meters. Ball valves are normally used for shutoff (isolation), and butterfly valves are used for flow control. However, drawing No. SK-N-04365 shows electrically actuated flow control ball valves upstream from the flow meter, and butterfly valves are shown as shut off valves. These valves should be located upstream of the flow meters so that the meter section can be isolated for service and removed if necessary. The air release valve should also be located at the highest point in the system. A combination air release/vacuum release valve should be used at the well head. (See Specific Comment 9.) This drawing should be revised and resubmitted with the pre-final submittal.

Response: With the state of technology in mag flow meters and articulated control valves the relative positioning of the two does not considerably affect the responsiveness of the system. However, the relative positioning of the two will be reversed in the final design. The ball valve referenced is a segmented ball valve which has acceptable flow controlling characteristics. The use of the segmented ball valve requires a smaller actuator to control the valve. Butterfly valves offer adequate shutoff capabilities and are cheaper (when actuators are not needed) than the ball valves. The ARV is the high point of the layout. The cascading of water and subsequent introduction of air into the system on shutdown is not desired therefore a vacuum breaker is not desired. The chemical injection port could be used to break vacuum should the draining of the downcomers be desired for a lengthy shutdown.

Action: The relative positioning of the control valve and the flow meter will be switched in the pre-final design. The pre-final design will clarify that these ball valves are segmented ball valves which are capable of adequately controlling the system. The pre-final design will allow butterfly valves as an alternate selection. See Section 13400 - Attachment A, Sheets 15, 16, 17, and 18 of Specifications.

RESPONSES TO OEPA COMMENTS ON THE REMEDIAL DESIGN, PRELIMINARY DESIGN PACKAGE FOR TASK 4: INJECTION DEMONSTRATION AND TASK 5: SOUTH PLUME OPTIMIZATION

Commenting Organization: OEPA Commentor: OFFO
Section#: 2 Pg.#: 2-1 Line#: Code: M
Original Comment# 1

Comment: What provisions are in place to modify the scope of the South Plume Optimization strategy if the current access difficulties are resolved? This package should include a brief discussion of the modeling described in the draft Baseline Strategy Report and a discussion that acknowledges that the well locations are constrained by access problems.

Response: If current access difficulties are resolved and it is determined the additional extraction wells are needed, then an "add-on" restoration module -- South Plume Optimization Phase II -- will be developed through a formal addendum to the RD Work Plan. If implemented the enforceable schedule and milestones for the South Plume Optimization Phase II Module will be submitted as an addendum to the RA Work Plan (as part of the pre-final design package for the new module).

As was discussed with U.S. EPA and OEPA on January 13, 1997 the draft Baseline Strategy Report is being revised. The following course of action has been agreed upon;

1) DOE will complete the geoprobe study, which is currently being conducted as part of the Restoration Area Verification Sampling Program, by the end of February.
2) DOE will meet with U.S. EPA and OEPA on the geoprobe results and to concur on the revised 20 μg/L total uranium plume definition.
3) DOE will run new groundwater modeling scenarios using the updated total uranium plume definition. The modeling scenarios which will be run were discussed with the U.S. EPA and OEPA on January 20, 1997 by phone.
4) DOE will share modeling results with the U.S. EPA and OEPA on March 18, 1997.
5) DOE will revise and re-submit the draft Baseline Strategy Report to the U.S. EPA and OEPA on April 7, 1997.

Action: As stated in the response.

Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section#: 1.4.2 Operation and Maintenance Plan - Task 2 Pg.#: 1-3 Line#:
Code: C
Original Comment# 2

Comment: The description of the master O&M Plan is more of a Operation Plan for the integrated groundwater remediation system at the FEMP. This is certainly necessary, but so is the inclusion of the maintenance procedures. The success of the groundwater remediation project will be very dependent on adequate maintenance of the system, insuring that it is operational. It would seem that Task 4 and Task 5 systems operations would be an opportunity to develop and refine maintenance procedures. Is there a way to integrate this information into Task 2, Operation and Maintenance Plan after it has been submitted? the submittal date is July 1, 1997.

Response: The injection demonstration will not commence prior to July of 1997 so any routine maintenance procedures developed during the injection demonstration will not be referenced in the Operations and Maintenance Plan issued in July of 1997. Routine maintenance procedures, developed and refined during actual injection demonstration operations, will be added to the Operation and Maintenance Plan, through revisions and updates.

Action: Develop routine maintenance procedures for the injection system during actual Groundwater Injection Demonstration Operations. Revise the Operation and Maintenance Plan to reference routine maintenance procedures for the injection system after they have been developed and refined through actual operating experience.

Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section#: 2.1, Project Objectives Pg.#: 2-2 Line#: Code: C
Original Comment# 3

Comment: Objective 2 states the design, construction and operation of the planned ID system will verify that injection technology enhances the aquifer remediation efforts. How will this enhancement be quantified and implemented beyond the specific wells involved? In Table 1-1 under Remedial Action Work Plans and Technical Reports, there are no reports or designs which would utilize the findings of Task 4, Injection Demonstration to benefit the remainder of the aquifer restoration project. Objective 6 of this section indicated the design should provide for expansion. What will cause this expansion to be implemented?

Response: The comment raises three questions: 1) How will enhancements due to groundwater injection be evaluated and ultimately implemented beyond the first five wells comprising the Injection Demonstration Module? 2) What future report or design will utilize the findings of the Task 4 Injection Demonstration? and, 3) What will cause an expansion in the injection demonstration system?

1) Enhancements to the aquifer restoration due to groundwater injection will be measured and evaluated through the collection of zone-specific and area-wide water-level and total uranium data from the aquifer (and comparison of the field data to desired conditions indicated by the FEMP's Great Miami Aquifer groundwater model). Target levels of uranium concentrations versus time at select locations in the aquifer, and desired area-wide potentiometric surface contours created by the pumping and injection wells, have been developed through the model. Actual total uranium data will be collected during the aquifer remediation to quantify the effect that pumping and injection are having on the 20 μg/L total uranium plume, and these results will be compared to the target results desired. Actual zone-specific and area-wide water-level data will be collected to document that hydraulic capture is being achieved as designed, and that pumping-related drawdown impacts at neighboring properties adjacent to the FEMP facility are as expected. The overall intent of the Injection Demonstration module is to demonstrate that desired regional water levels and flow gradients can be achieved, that the necessary injection rates can be sustained over the long term at the field scale, and that the injection process does not cause inadvertent excursions of the plume (laterally or vertically) beyond the FEMP's designated points of capture. If successful at the field scale, the technology will be incorporated into the FEMP's full site remedy, at the desired locations indicated by the Baseline Remedial Strategy Report. A test plan for monitoring the Injection Demonstration progress and success will be developed in the Spring of 1997 and will be incorporated into the FEMP's Aquifer Restoration Operations and Maintenance Plan to be submitted to EPA and OEPA in July, 1997. Following a prescribed period of time to be outlined in the test plan, a final report documenting the success of the Injection Demonstration will be prepared. The test plan and final report is necessary to satisfy the specific needs of DOE's Office of Science and Technology Development (EM-50), who is funding the demonstration. The FEMP will also submit the plan and final report to EPA and OEPA.

2) OEPA is correct in indicating that Table 1-1 does not list a specific Remedial Design Deliverable that will incorporate the findings of the injection demonstration. While specific design deliverable(s) are not identified, the mechanism for producing them exists. Section 3.3.4 of the OU5 RD Work Plan discusses how, if the injection process proves

successful at the field scale through the Injection Demonstration Module, additional injection wells will be incorporated into the individual design packages for the future area-specific restoration modules as needed. The Baseline Remedial Strategy Report (to be submitted to EPA and OEPA in April, 1997) will establish the need for (and desired locations of) any additional injection wells beyond those comprising the Injection Demonstration Module. If the injection demonstration is successful, and the Baseline Strategy Report recommends additional injection wells, they then will be incorporated into the future RD design modules as needed. If, for some reason additional injection wells are desired or needed to enhance an existing in-place (rather than future) module, they will be accommodated through addenda to the existing design documents already furnished to EPA and OEPA, as described in Section 3.3.3 of the RD Work Plan.

3) At this time, an expansion beyond the Injection Demonstration Module is not yet formally proposed. The decision to extend injection beyond the Injection Demonstration Module will be made based on: 1) the needs identified through the Baseline Remedial Strategy Report; and 2) the findings and success of the demonstration at the field scale. Clearly, there are benefits to injection that have been identified by the groundwater computer model; the remaining questions revolve around demonstrating that logistical concerns (iron fouling, sustainability of injection rates) can be maintained over the longer term, field scale. It should also be noted that future actual operational data for the aquifer restoration project may indicate that it would be beneficial if injection were implemented at additional locations beyond those initially indicated by the Baseline Strategy Report. While at this point the need for such additional wells is considered unlikely, as part of the FEMP's commitment to adopt "learn as you go and respond accordingly" principles throughout the cleanup effort, the FEMP will watch for such needs during the remedy tracking activities accompanying the Integrated Environmental Monitoring Plan (IEMP). If such a future determination is ever made, then the contingencies for expansion which are recognized as part of the overall modular remedial design concept in the RD Work Plan would be utilized.

Action: No revision to the design is required.

Commenting Organization: OEPA Commentor: GeoTrans, Inc.
Section#: 3.5 Secondary Containment Pg.#: 3-20 Line#: Code: C
Original Comment#
Comment: In this section, it is stated that the need for secondary containment is governed by DOE Order 6430.1A. It is also stated that this project does not require secondary containment because a safety assessment classified this project as an industrial facility conducting hazardous waste activities. Please reference the safety assessment described in this section.
Response: Agree - Reference FERMCO Safety Assessment 96-1024, dated 5/01/96.
Action: No revision to the design is required.

ATTACHMENT 1

SIGNIFICANT CHANGES FROM PRELIMINARY DESIGN
FEBRUARY 3, 1997

The following is a listing of significant design changes that have taken place since the submittal of the Preliminary Design Package for Task 4: Injection Demonstration and Task 5: South Plume Optimization:

1. The South Plume Optimization (SPO) valve house has been relocated to south of Willey Road, at the north edge of the existing Weber easement. The relocation was the result of the change in the routing of the optimization wells' discharge lines prompted by landowner objections to the original routing.

2. Due to landowner objections, the routing of the discharge line from each optimization well has changed and now runs south and east to the relocated SPO valve house. The two header system leaving the SPO valve house was eliminated (with EPA and OEPA approval) and now the flows are combined into a header which then ties into the existing 20" force main. The combined flow is then conveyed to the South Field Extraction System valve house where it can be directed to treatment or discharge.

3. Due to landowner objections, the power feed to the optimization wells will not come from Paddys Run Road but will come from an extension of the existing CG&E pole line serving the South Plume Recovery Wells. The pole line will be extended to the SPO valve house from which the power feed will then go underground to the wells.

DESIGN IMPROVEMENTS TO EXISTING SOUTH PLUME WELL FIELD

The South Plume Optimization and Injection Demonstration Design Package is also upgrading several key components of the existing South Plume Removal Action well field as summarized blow.

- Sweat-wrap piping in valve pits to reduce moisture
- Replace high maintenance "Cla-Val" with motorized valve
- Place limit switches on new motorized valve to indicate full closed or open
- Run new control cable aboveground to new SPO valve house to improve maintenance and reduce operational downtime during construction
- Provide remote control of flow control valve and pump on/off at AWWT
- Alarms monitored around-the-clock at AWWT
- Provide local indicators of flow rate at each well

These improvements are within the drawing and specification package.